

Claims

1. A cooling module consisting of a charge air cooler  
5 and a recirculated exhaust gas cooler, the charge  
air cooler comprising a heat exchange bundle (2)  
for cooling the charge air and the recirculated  
exhaust gas cooler comprising a heat exchange  
bundle (4) for cooling the recirculated exhaust  
10 gases, characterized in that the charge air cooler  
heat exchange bundle (2) and the recirculated  
exhaust gas cooler heat exchange bundle (4) are  
assembled in a single brazing operation and in  
that they are also assembled with one another  
15 during this same brazing operation.
2. The cooling module as claimed in claim 1, further  
comprising a wrapper (6) housing the charge air  
cooler and recirculated exhaust gas cooler bundles  
20 (2, 4), said wrapper (6) being assembled with  
these bundles during the single brazing operation  
during which these bundles are assembled with one  
another.
3. The cooling module as claimed in claim 2,  
25 characterized in that the charge air cooler  
further comprises an inlet header box (30) for the  
air that is to be cooled immediately adjacent to  
an inlet end of the charge air cooler heat  
exchange bundle (2) and an outlet header box (32)  
30 for the cooled air immediately adjacent to an  
outlet end of the charge air cooler heat exchange  
bundle (2), and in that the wrapper (6) comprises  
a first and a second peripheral rim which protrude  
on each side of the charge air cooler bundle (2),  
35 the charge air cooler inlet header box being  
assembled with one of these rims, the charge air  
cooler outlet header box (32) being assembled with  
the other of these peripheral rims.

4. The cooling module as claimed in claim 3, characterized in that the dimensions of the wrapper (6) are chosen such that they delimit a first and a second empty space (88, 90), one at an inlet end and one at an outlet end of the charge air cooler heat exchange bundle (2), the first and second empty spaces respectively constituting an inlet header box and an outlet header box for the charge air.
5. The cooling module as claimed in one of claims 2 to 4, characterized in that the wrapper (6) comprises two half-casings (7, 8).
6. The cooling module as claimed in claim 5, characterized in that the two half-casings (7, 8) are able to slide one with respect to the other in order to accommodate variations in height of at least one of the heat exchange bundles (2, 4).
7. The cooling module as claimed in one of claims 5 and 6, characterized in that each of the two half-casings (7, 8) has a U-shaped cross section comprising an end wall (10) and two lateral edges (12) situated one on each side of the end wall (10), the lateral edges (12) of one of the half-casings sliding with respect to the lateral edges of the other half-casing.
8. The cooling module as claimed in one of claims 5 and 6, characterized in that each of the two half-casings (7, 8) has the shape of a container comprising a peripheral rim, the peripheral rim of one half-casing being able to fit into the peripheral rim of the other half-casing and to slide with respect to the latter.
9. The cooling module as claimed in one of claims 2 to 8, characterized in that the wrapper (6)

comprises a pressed housing (14) which accommodates the recirculated exhaust gas cooler bundle (4).

5 10. The cooling module as claimed in one of claims 2  
to 9, characterized in that the wrapper (6)  
comprises a separate recirculated exhaust gas  
cooler casing (73), this separate casing (73)  
10 being brazed in a single operation to one of the  
two half-casings (7, 8) during the single brazing  
operation during which the bundles (2, 4) are  
assembled with one another.

11. The cooling module as claimed in one of claims 9  
15 and 10, characterized in that the recirculated  
exhaust gas cooler comprises an inlet header box  
(16) for the recirculated exhaust gases  
immediately adjacent to an inlet end of the  
recirculated exhaust gas cooler heat exchange  
20 bundle (4) and an outlet header box (18) for the  
recirculated exhaust gases immediately adjacent to  
an outlet end of the recirculated exhaust gas  
cooler heat exchange bundle (4), the housing (14)  
or the separate casing (76) for the recirculated  
25 exhaust gas cooler bundle (4) delimiting a first  
and a second empty space (16, 18), one at an inlet  
end and one at an outlet end of the recirculated  
exhaust gas cooler heat exchange bundle, the first  
and second empty spaces respectively constituting  
30 the inlet header box (16) and the outlet header  
box (18) for the recirculated exhaust gases.

12. The cooling module as claimed in one of claims 5  
to 11, characterized in that at least one of the  
35 two half-casings comprises an end wall which is  
taller so as to make it easier to install the  
recirculated exhaust gas cooler.

13. The cooling module as claimed in one of claims 5

5 to 12, characterized in that it comprises a passage (18, 72, 79) for the recirculated exhaust gases which opens directly into the outlet header box (32) of the charge air cooler, the cross section of this passage being equal to or greater than the cross section of the recirculated exhaust gas cooler bundle (4).

10 14. The cooling module as claimed in one of the preceding claims in which the charge air cooler heat exchange bundle (2) and the recirculated exhaust gas cooler heat exchange bundle (4) are made of aluminum and/or aluminum alloy.

15 15. The cooling module as claimed in claim 14 in which the wrapper (6) is also made of aluminum and/or aluminum alloy.

20 16. The cooling module as claimed in claim 15 in which the header boxes (16, 18, 30, 32) of said coolers are also made of aluminum and/or aluminum alloy.